NUOPC

NATIONAL UNIFIED OPERATIONAL PREDICTION CAPABILITY

*A **strategic partnership** to fundamentally advance the nation's computer weather prediction system and improve forecast models used by National Weather Service, Air Force and Navy meteorologists, mission planners, and decision makers.*

National Unified Operational Prediction Capability

NUOPC PARTNERSHIP

- NOAA, Navy, Air Force partnership to improve the Nation's weather forecast capability
- A National System with a Tri-Agency commitment to address common requirements
- Unified technology architecture
- Multi-component system with interoperable components built on common standards and framework
- Uses joint ensemble forecasts to:
  - Significantly improve forecast accuracy
  - Quantify, bound, and reduce forecast uncertainty
  - Produce most probable forecast, e.g. high impact weather
  - Provide mission specific ensemble products
  - Drive high-resolution regional and local predictions
  - Drive other downstream models and decision aids
- A national global NWP research agenda to accelerate development and transition

NUOPC VISION

The future US national global prediction system managed in the national interest meeting the national need for better forecast guidance and built on:

- Partnership of responsible Federal agencies
- Common modeling framework linking operations, research and Federal partners
- Common R&D agenda guiding future development.

GOALS

- Share development among government agencies
- Global atmospheric ensemble system for enhanced predictive capability
- National research agenda, to engage the broader community in the effort
- Accelerate transition of new technology to the civilian and DoD operating centers
- A Common Model Architecture to enhance interoperability and transition to operations

Project Manager – Fred Toepfer, NOAA
301 713-1783 x165
Deputy PM – Dave McCarren, Navy
301 713-3557 x161

http://www.weather.gov/nuopc/

National Unified Ensemble (NUE)

- Multi-model ensemble combining NOAA and Navy systems
- 73 variables exchanged for mission specific products
- Ensembles combined to create product fields
- Probabilistic basis for improved decision-making
- Tri-agency management team for operations
- Compatible with Canadian Meteorological Centre ensemble
- Fields available as part of the NAEFS partnership
- Managed ensemble diversity to better capture the total error of the system

Scientific Challenges

- Improved Hurricane forecast track & intensity performance
- Improved performance for NextGen aviation weather
- Managed ensemble to capture uncertainty and realistic probability of events
- Post-processing and development of new generation products
- Continue development toward a Future Model Architecture

Progress to Date

- Initial Operational Capability of the National Unified Ensemble (NUE)
- Common Model Architecture being developed
  - Component and Coupler Templates
  - Prototype code available
  - Common guidance on Model Metadata
  - NUOPC Compliance Checker
  - Examples and use guidance available
  - NUOPC Interoperability Standards including ESMF Public Release 5.2 and Prototype Coupling Code
  - NUOPC Layer as developer tool for broad community
  - Community use growing
- Unified Ensemble Operations Committee in place
- Common cross-agency metrics implemented
- Collaborative workshops held (R&D/Ensemble Design)
- Post-processing plan/standard algorithms in development
- User products in development

History

- October 2005 goal of Tri-Agency NWP efforts established
- February 2006 formed team to identify unified operational prediction capability options
- May 2006 course of action analysis for NUOPC
- January 2007 recommendation to pursue Coordinated Research & Development with Coordinated Transition and Operations
- March 2007 initial Concept of Operations, Implementation Plan, and cost analysis developed and approved in Oct 2007, Phase I initiated, FY08 to FY10
- January 2008 NUOPC project introduced to the annual convention AMS
- January 2009 AMS Town Hall Meeting on NUOPC
- October 2009 Phase II initiated
- January 2011 IOC-1 achieved